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REMARKS

Claim Rejections - 35 USC §112

Claims 1-17 and 19 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention because there are insufficient antecedent bases for the limitation "the received data signal" in certain of the claims.

Claims 1-17 and 19 have been amended to delete "received" before "data signal" in each occurrence. There is now an antecedent basis for every occurrence of "data signal".

Claims 1-17 and 19 are now believed to particularly point out and distinctly claim the subject matter, which the applicant regards as the invention, and to now be allowable under 35 USC §112, second paragraph.

Claim Rejections - 35 USC §102

Claim 10 is rejected under 35 USC §102(a) as being anticipated by IBM Technical Disclosure Bulletin, "Computer Input Device Via Nerve Signal," August 1989 (hereinafter "IBM").

With regard to claim 10, this independent claim has now been clarified to amend the previously claimed combination to now include the limitations that:

- "(1) coupling a sensing device to user's wrist, the sensing device capable of sensing wrist's muscle movements due to hand digit-bending movements within a certain range of angle for representing a specific character to thereby produce a corresponding electrical signal;
- (2) converting the electrical signal into a corresponding data signal;"

The Examiner states in the Office Action of 1/15/04 (hereinafter the "Office Action":

"IBM describes the limitation of claim 10. As illustrated in Fig. 1, a sensing device (EMG sensors) coupled by the user's wrist is disclosed. Similar to the current claim, the sensing device is capable of sensing wrist's muscle movements to thereby produce a corresponding electrical signal (see IBM, pages 1-3). Sensing the user's wrist muscle movements to thereby produce a corresponding data signal is also disclosed (see IBM, pages 1-3). Transmitting the data signal to the computer system is also disclosed (see IBM, Fig. 2).

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Once the data signal is received by the computer, the computer matches or maps the data signal to the corresponding alpha numeric character and displaying the alpha numeric character on a computer screen (see IBM, pages 1-3)."

Dry 11
It is respectfully submitted that IBM does not disclose a piezoelectric sensor, "the sensing device capable of sensing wrist's muscle movements due to hand digit-bending movements within a certain range of angle for representing a specific character to thereby produce a corresponding electrical signal", or the "converting the electrical signal into a corresponding data signal" recited in the amended claim 10.

The Computer Input Device Via Nerve Signal disclosed in IBM is a cuff with electromyographic (EMG) sensor worn between the wrist and elbow of the user, for detecting nerve signals to the fingers. The cuff clearly does not need any finger movements as disclosed in IBM (from lines 36-42, page 3), and the sensor receives the nerve signals, instead of signal corresponding to the wrist's muscle movements as a result of bending hand digits within a certain range of angle. Therefore, IBM does not disclose the claimed sensing device coupled to the user's wrist recited in the amended claim 10.

Based on the above, it is respectfully submitted that claim 10 is allowable under 35 USC §102(a) as not being anticipated by IBM because:

"[a]nticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration." *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). *Carella v. Starlight Archery*, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *modified on reh'g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); *RCA Corp. v. Applied Digital Data Sys., Inc.*, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Claim Rejections - 35 USC §103

Claims 11-19 are rejected under 35 USC §103(a) as being unpatentable over IBM Technical Bulletin, "Computer Input Device Via Nerve Signal" (hereinafter "IBM"), in view of Fukumoto et al. (USPN 6,380,923, hereinafter "Fukumoto").

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With regard to claim 11, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, Fukumoto is cited for the wearable input device with piezoelectric sensor that is lacked in IBM. However, Applicant respectfully submits that one skilled in the art would not be motivated to combine IBM and Fukumoto. In Fukumoto, the sensors are actually shock sensors worn on each finger to detect the shocks generated at the time when a fingertip strikes any typing surface. The shock signal is then converted into light signal that is received by the light receptor built in the wrist-style band. Therefore, neither the shock sensors nor the light receptors teach or suggest the claimed piezoelectric sensors worn on the user's wrist for sensing the user's wrist muscle movements due to the user's hand digit-bending movements within a certain range of angle.

According to Applicant's claimed invention, bending of the hand digits within a certain range of angle represents a keyboard character intended for input to the computer system, the bending movement is sensed by the piezoelectric element to produce an electrical signal, which electrical signal is converted and processed into a digital and transmittable form before being transmitted to the computer system. Once the signal is received by the computer system, the signal is mapped with corresponding character in a pre-defined character mapping table, so that the retrieved character is displayed on the monitor screen.

With regard to claim 12, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, as explained for claim 11, IBM in view of Fukumoto does not teach or suggest a piezoelectric sensor attached to the user's wrist to sense the wrist's muscle movement representing a keyboard character intended for input to the computer system and to produce a corresponding electrical signal.

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With regard to claim 13, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, IBM in view of Fukumoto does not teach or suggest a piezoelectric sensor as explained for claim 14.

With regard to claims 14 and 15, these dependent claims respectively depend from independent claim 10 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

More particularly, IBM in view of Fukumoto does not teach or suggest a signal conversion unit is coupled to a piezoelectric element to convert an output signal into a data signal that is a digital signal or that is an analog signal.

With regard to claim 16, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, IBM in view of Fukumoto does not teach or suggest that the signal filtering mechanism is a signal processing unit coupled to a signal conversion unit or is capable of modulating the data signal into a transmittable form.

With regard to claim 17, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, IBM in view of Fukumoto does not teach or suggest a signal conversion unit is coupled to a piezoelectric element to convert an output signal into a data signal.

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With regard to claim 18, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

More particularly, IBM in view of Fukumoto does not teach or suggest a signal conversion unit is coupled to a piezoelectric element to convert an output signal into a data signal.

With regard to claim 19, this dependent claim depends from amended independent claim 10 and is believed to be allowable since it contains all the limitations set forth in the independent claim from which it depends and claims unobvious combinations thereof.

Based on the above, it is respectfully submitted that claims 11-19 are now allowable under 35 USC §103(a) over IBM in view of Fukumoto because not all the elements have been taught or suggested and only separate elements have been shown, and in obviousness:

"[t]he question is whether the prior art, considering its scope and content and the level of ordinary skill, must itself suggest the combination of separate elements into the claimed invention in suit, not just whether it illustrates separate elements..." *Lairam Corp. v. Cambridge Wire Cloth Co.*, 226 USPQ 298 at 293n (D. Md. Mag. 1985), aff'd in part, rev'd in part, and remanded, 785 F.2d 292, 228 USPQ 935 (Fed. Cir. 1986), cert. denied, 479 U.S. 820 (1986)

The other references cited by the Examiner showing the prior art have been considered and are not believed to disclose, teach, or suggest, either singularly or in combination, Applicant's invention as claimed.

Other

The Abstract has been amended to less than 150 words to conform with 37 C.F.R. §1.72(b). Claims 18 and 19 have been amended to include a colon and carriage return at the end of the preamble. No new matter has been added.

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Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-19 at an early date is solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,



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